REMARKS

Applicant acknowledges the Advisory Action dated 11/04/2009 and respectfully requests a continued examination of the application.

Claims 72-142 are pending in the application. In the present amendment, claims 72, 75, 82, 85, 99, 101, 108, 110, 118, 121, 131 and 134 have been amended. Accordingly, after entry of the present request, claims 72-142 will be subject to examination.

The Office Action dated 07/30/2009 rejected claims 72-93, 96-97 and 117-142 under 35 USC 103(a) over Agrafiotis et al., US 2002/0091655, now US 7,039,621 in view of Shmulevich et al., US 2003/0225718, now US 7,257,563. In addition, the Office Action rejected claims 94-95 under 35 USC 103(a) over Agrafiotis in view of Shmulevich and further in view of Granger, US 6,463,321; rejected claims 98-106 under 35 USC 103(a) over Agrafiotis in view of Shmulevich and further in view of Schipper, US 5,581,259; and rejected claims 107-116 under 35 USC 103(a) over Agrafiotis in view of Shmulevich and further in view of Blaney et al., US 5,680,331.

The Advisory Action restated the rejections of claims 72-142 and discussed the rejection of claim 72 in four different sections.

These rejections are respectfully traversed at least for the reasons discussed in the response filed on October 26, 2009, which is not repeated here for the sake of brevity but is incorporated herein by reference. Instead, the present remarks will discuss the four sections of the Advisory Action related to claim 72.

(1) The primary reference Agrafiotis teaches a method for mapping n-dimensional input patterns into a m-dimensional space so as to preserve relationships that may exist in the n-dimensional space. The method disclosed by Agrafiotis is rooted on the principle of probability sampling, i.e. the notion that a small number of randomly chosen members of a given population will tend to have the same characteristics, and in the same proportion, as the population as a whole. Such approach employs an iterative algorithm based on subset refinements to nonlinearly map a small random sample, which reflects the overall structure of the data and then "learns" the underlying nonlinear transform using a set of distributed neural networks, each specializing in a particular domain of the feature space. The partitioning of the data space can be carried out using a clustering methodology. See, e.g. Agrafiotis at the Abstract and paragraph [0042].

The Office Action of 07/30/2009 has cited paragraphs [0026], [0050]-[0053], [0090],

[0096]-[0097], [0110], [0117] and [0119] of Agrafiotis as particularly relevant. These paragraphs essentially relate to an embodiment, which is based on local learning and in which the space R^n is partitioned into a set of Voronoi polyhedra and a separate "local" network is used to project the patterns in each partition. In particular, the Voronoi cells partition the input data space R^n into local regions "centered" at reference points P. Once local networks are trained, patterns from the input set of patterns can be mapped into space R^m using the method illustrated in FIG.6 of Agrafiotis. The distance of the input pattern x to each reference point is determined, and the point C_j that is nearest to the input pattern x is identified. The pattern x is then mapped to a point y in R^m, using the local neural network Net_j^L. See, e.g., Agrafiotis at paragraphs [0093], [0094] and [0109].

While the differences between the methods disclosed by Applicant and by Agrafiotis are apparent, the Advisory Action has noted that the language of claim 72 does not mention what network environment the invention is implemented in. Applicant respectfully disagrees and believes that recitations in claim 72, such as "a distance between each record," indicate that the invention is implemented in a global environment. In order to expedite allowance of the application, claim 72 has been amended to more clearly recite that the invention is based on a global environment rather than on the clustered environment disclosed by Agrafiotis. See, e.g., the amended recitations of claim 72: "calculating a distance between each record and all the other records in the database," "an evolutionary algorithm applied to all the records in the database at the same time," or "a distance matrix between each record and all the other records in the database."

(2) The cited method of Agrafiotis also does not teach "calculating the N-1 coordinates of each record in the N-1 dimensional space using an evolutionary algorithm applied to all the records in the database at the same time" and "wherein in said evolutionary algorithm comprises combinatory criteria that include marriages and mutations, and wherein at least a number of marriages and of mutations of individuals are adaptive self-definable internal variables." Instead, Agrafiotis teaches that the algorithm is not applied to all the records at the same time, and also teaches the use of an iterative nonlinear mapping algorithm rather than an evolutionary algorithm as claimed by Applicant.

The Advisory Action has held that Agrafiotis teaches the use of an evolutionary algorithm. "Evolutionary algorithm" is an umbrella term used to describe computer based problem-solving systems, which use computational models of some of the known mechanisms of evolution as key elements in their design and implementation. See, e.g., JÖRG

HEITKÖTTER AND DAVID BEASLEY, The Hitch-Hiker's Guide to Evolutionary Computation, Available online. It is submitted that the iterative nonlinear mapping algorithm taught by Agrafiotis does not fit this definition.

The Advisory Action has further held that Shmulevich teaches an evolutionary algorithm providing for marriages and mutations. Applicant submits that the algorithm taught by Shmulevich does not teach marriages but only mutations. Likewise, the DDLab Software cited in the Office Action and in the Advisory Action is not known to Applicant to provide for marriages but instead to construct networks by extending Boolean attributes to multi-value, and by constructing attractor basins and graphs that link network states according to their transitions. See, e.g., ANDREW WUENSCHE, Discrete Dynamics Lab: tools for investigating cellular automata and discrete dynamical networks, Available online. Accordingly, Agrafiotis and Shmulevic fail to teach the above limitation of claim 72.

(3) Further, the cited method of Agrafiotis does not teach "defining a best projection of the records onto the N-1 dimensional space as a projection in which a distance matrix between each record and all the other records in the N-1 dimensional space best fits or has minimum differences with the distance matrix of the records calculated in the N-dimensional space."

The Advisory Action has held that the disclosure at paragraph [0110] of Agrafiotis related to "identifying the nearest local network and using that network on a feed-forward manner to perform the projection" would provide this limitation. Applicant submits that the cited disclosure of Agrafiotis does not teach or suggest the above limitation of claim 72. The disclosure of Agrafiotis is premised on identifying a limited number of patterns in R^n by measuring distances between reference points and the nearest points; mapping those patterns in the R^m (wherein $m<n$) with a local neural network; adding patterns in R^n; and forward-feeding the added patterns in R^m by identifying the nearest local networks. Therefore, Agrafiotis is premised on using distances within clusters of points and not on applying a globalized approach based on a matrix of the distances between each point and each other point in the database.

(4) Finally, the Advisory Action has held that a motivation to combine Agrafiotis and Shmulevic is present because Agrafiotis and Shmulevic "can be combined as described in the Office action mailed on July 30, 2009." Applicant respectfully disagrees with this analysis.

First, as shown above, Agrafiotis and Shmulevic fail to teach or suggest all the elements of claim 72.

Moreover, an analysis of obviousness requires a determination that a person skilled in the art, at the time of Applicant's invention, *would* have combined (had a reason to combine) the cited references, rather than *could* have combined those references. "[A] patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art." *KSR v. Teleflex*, 82 USPQ2d 1385, 1396 (2007). Here, a person skilled in the art, reading Agrafiotis, would have been motivated to base a projection of data on probability sampling, which is at the root of the disclosure of Agrafiotis. That person would then have mapped a small random sample nonlinearly using either the iterative algorithm taught by Agrafiotis or the Boolean network taught by Shmulevic, and would have used that algorithm to "learn" the underlying nonlinear transform using a set of distributed neural networks, each specializing in a particular domain of the feature space. Such approach is contrary to the global approach and to the methodology taught by Applicant, thereby negating obviousness.

Based on the foregoing, the withdrawal of the rejection of claim 72 under 35 USC 103(a) is respectfully requested. Claims 73-142 are patentably distinguishable over the cited references for the same reasons as claim 72 and for the additional limitations contained therein.

Conclusion

It is believed that all objections and rejections in the application have been addressed and that the application is in condition for allowance. A notice to that effect is respectfully requested.

A fee under 37 CFR 1.17(e) for the request for continued examination and a fee under 37 CFR 1.17(a)(2) for a two-month extension of time are enclosed herewith.

Dated: December 30, 2009

Respectfully submitted,

/Franco A. Serafini/
Franco A. Serafini, Registration No. 52,207
Attorney for Applicant
Tel. (858) 456-2898

THEMIS LAW
7660 Fay Ave Ste H-535
La Jolla, CA 92037